Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of Globalstar, Inc. Petition for Notice of Inquiry Regarding the Operation of Outdoor U-NII-1 Devices in the 5 GHz Band	RM-11808

REPLY OF QUALCOMM INCORPORATED

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Summary

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Qualcomm opposes the Globalstar Petition for Notice of Inquiry[1] because it is based on misplaced assumptions and a flawed technical analysis alleging that Globalstar's satellite system will soon experience harmful interference caused by unlicensed devices operating in the 5150-5250 MHz U-NII-1 band. Globalstar's technical paper is highly questionable on multiple grounds: Its interference analysis sweeps in signals from outside the U-NII-1 band; it alleges interference from nationwide U-NII-1 operations based on a very limited set of measurements from a single point over the Midwest; and its alleged 2 dB increase in the noise floor is based on a measurement technique that, at best, measures noise levels in 1 dB increments. Moreover, Globalstar's claims are expressly contradicted by the U.S. government's contribution to the ITU recommending that the FCC's U-NII-1 framework be applied worldwide.

As explained herein, this important unlicensed band is used today by many service providers to provide gigabit or better connectivity to mobile users. The U-NII-1 band supports

[1] *See* Globalstar Petition for Notice of Inquiry, RM-11808 (filed May 21, 2018); FCC Public Notice, Consumer & Governmental Affairs Bureau Reference Information Center Petition for Notice of Inquiry, Report No. 3092 (rel. June 6, 2018).

Wi-Fi and LTE Unlicensed technologies, LTE-U and LAA, and will soon support next-generation Wi-Fi and 5G unlicensed services. And Qualcomm technology is a core part of these wireless technology advances that have enhanced and will continue to improve America's communications services and applications, driving economic growth and enhancing our daily lives. The outdoor use of the UNII-1 band is manifestly in the public interest.

Globalstar's Petition must be dismissed because it effectively seeks reconsideration of arguments and claims Globalstar previously made — and the FCC rejected — following a thorough review of the record demonstrating that allowing outdoor low-power unlicensed operations in the U-NII-1 band will enable improved broadband connectivity, which it has done, without negatively impacting satellite service. There is no need for any new Notice of Inquiry.

Qualcomm Agrees With The Multiple Substantive Pleadings Requesting Dismissal Of The Globalstar Petition

Qualcomm strongly supports the multiple substantive oppositions requesting the Commission to dismiss the Petition because Globalstar fails to provide any reasonable basis for the Commission to initiate an inquiry into alleged U-NII-1 interference into the Globalstar system.[2] Indeed, there are major problems with the technical showing in Globalstar's Petition, as these oppositions explain.

First, Globalstar's interference analysis sweeps in signals from outside the U-NII-1 band. The analysis fails to consider noise sources originating from 5096-5150 MHz, which includes federal government operations below the 5150-5250 MHz U-NII-1 band. Instead the analysis assumes any and all increased noise levels inside Globalstar's licensed spectrum are due entirely

[2] *See* Comments of Wireless Internet Service Providers Association; Opposition of Cisco Systems, Inc.; Opposition of NCTA – The Internet & Television Association; Opposition of the Wi-Fi Alliance (each filed July 6, 2018).

to outdoor U-NII-1 operations. However, U-NII-1 unlicensed operations overlap only with approximately half of Globalstar's channels.

Second, Globalstar's allegation of potential interference from nationwide U-NII-1 operations is based on a very limited and questionable set of measurements from a single site above the Midwest U.S. Globalstar relies on measurements lasting only a few minutes at a time and only for a few times each month from a single location over Lincoln, Kansas. It is far from clear how such limited measurements can accurately show the existence of a problem due to U-NII-1 operations. Also, Globalstar's limited measurements show no consistent difference between day and night operations even though U-NII-1 unlicensed operations are more active during the daytime hours and less active during nighttime.

Third, Globalstar alleges a 2 dB increase in the noise floor based on a measurement technique that, at best, measures noise levels in 1 dB increments. Measurements made with such rough accuracy allow small deviations in noise floor levels to significantly skew results.

Accordingly, the Globalstar Petition is based upon a highly questionable technical showing, and even if one assumes that the technical analysis is accurate, which it is not, it still fails to show any evidence of harmful interference from U-NII-1 operations. The Commission should dismiss the Petition.

If and when Globalstar demonstrates that it is experiencing harmful interference from U-NII-1 operations, it can petition the Commission "for immediate regulatory relief" as Globalstar itself notes in its Petition.[3] There is no reason for the FCC to take any action at this time for the reasons explained herein and in the many substantive oppositions.[4]

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[3] See Petition at 3.

[4] *See* n.2, *supra*.

Finally, Globalstar's claims are expressly contradicted by the U.S. government's contribution to the ITU advocating to extend throughout the world the FCC's U-NII-1 framework by following the successful spectrum sharing framework between Globalstar's Mobile Satellite Service and U-NII-1 operations in the U.S. This contribution provides a technical analysis explaining that unlicensed operations in the 5150-5250 MHz band pose no risk of harmful interference to Globalstar's system. Globalstar's Petition to the FCC thus runs counter to the U.S. Government's international position, and should be dismissed on this basis alone.

Qualcomm Technology Innovations Use The U-NII-1 Band To Support Gigabit Connectivity And Enhanced Services For American Businesses and Consumers

Qualcomm's wireless technology innovations have, to a great extent, driven the wireless industry from 2G to 3G to 4G and now to 5G. We continue to lead the mobile industry today with our pioneering 5G NR mobile chipsets that operate in low-bands, mid-bands, and the millimeter wave bands, using licensed, unlicensed, and shared spectrum to deliver improved mobile broadband connectivity with fiber-like speeds.[5] Just today, Qualcomm unveiled the world's first fully-integrated 5G New Radio ("5G NR") millimeter wave and sub-6 GHz RF modules for smartphones and other mobile devices.[6]

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[5] *See* Qualcomm Press Release, "Global OEMs Select Qualcomm Snapdragon X50 5G NR Modem Family for Mobile Device Launches in 2019 — Qualcomm and Mobile Device OEMs Focus on Delivering Next-Generation 5G Mobile Experiences with Low Latency, Extreme Capacity and Fiber-Like Connectivity to the Cloud," (Feb. 8, 2018) *available at* https://www.qualcomm.com/news/releases/2018/02/08/global-oems-select-qualcomm-snapdragon-x50-5g-nr-modem-family-mobile-device.

[6] *See* Qualcomm Press Release, "Qualcomm Delivers Breakthrough 5G NR mmWave and Sub-6 GHz RF Modules for Mobile Devices," (July 23, 2018) *available at* https://www.qualcomm.com/news/releases/2018/07/23/qualcomm-delivers-breakthrough-5g-nr-mmwave-and-sub-6-ghz-rf-modules-mobile.

Qualcomm pioneered the development of 802.11ax technology for use in the 5 GHz unlicensed bands and 802.11ad technology for use in the 60 GHz unlicensed band.[7] Qualcomm also developed the technology to enable the introduction of LTE in the 5 GHz U-NII bands, through LTE-U and LAA, to support gigabit LTE services.[8] For example, LAA allows a mobile service provider to support gigabit LTE services with as little as 20 MHz of licensed spectrum by aggregating the 5 GHz unlicensed bands, including the 5150-5250 MHz U-NII-1 band. LAA technology is rolling out rapidly all over the country, and the technology is performing extremely well — enabling better, faster mobile broadband.[9]

The Globalstar Petition mistakenly asserts that the FCC's U-NII-1 rules "do not apply specifically" to LTE-U/LAA small cells and that the FCC has not adopted any new rules "specifically applicable" to LTE-U-LAA.[10] These assertions demonstrate a fundamental misunderstanding of the Commission's unlicensed regulatory framework and of the U-NII-1

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7 *See, e.g.*, Qualcomm Press Release, "Qualcomm Introduces the Industry's First Integrated 802.11ax-ready Solution for Smartphones and Computing Devices — Highly Integrated Solution Coupled with Key 802.11ax Features, Leading Edge Bluetooth Features, Advanced WPA3 Security Features and Proprietary Enhancements Delivers Unparalleled Performance, Security and Time-to-Market Advantages," (Feb. 21, 2018) *available at* https://www.qualcomm.com/news/releases/2018/02/21/qualcomm-introduces-industrys-first-integrated-80211ax-ready-solution; Qualcomm 802.11ad website, "Pushing the limits of high-speed Wi-Fi," *available at* https://www.qualcomm.com/solutions/networking/features/80211ad, *last accessed* July 23, 2018.

8 *See* Qualcomm Licensed Assisted Access (LAA) website, "Extending LTE to unlicensed spectrum globally – LAA," *available at* https://www.qualcomm.com/invention/technologies/lte/laa, *last accessed* July 23, 2018.

9 *See* Monica Alleven, "T-Mobile seeing 5-10x increase in speeds thanks to LAA," FIERCE WIRELESS (Feb. 12, 2018); Monica Alleven, "AT&T rolls out LAA in downtown Indianapolis" FIERCE WIRELESS (Nov. 16, 2017); Martha DeGrasse, "Verizon starts nationwide LAA deployment - Four-channel carrier aggregation uses three channels of unlicensed spectrum," RCRWIRELESS NEWS (Aug. 4, 2017). *See also* Mike Dano, "Dueling reports show major increase in U.S. wireless network speeds," FIERCE WIRELESS (July 18, 2018).

10 *See* Petition at 14-15 & n.43.

rules, in particular. All unlicensed devices that operate in the U-NII-1 band, which includes the multiple generations of 802.11 Wi-Fi and LTE-U/LAA, must comply, and indeed do comply, with the Commission's rules for unlicensed U-NII operations. These include the several provisions covering outdoor unlicensed U-NII-1 operations that are designed to protect Globalstar's operations.[11] The FCC does not need to define new rules to enable new unlicensed technologies, such as future generations of Wi-Fi, LTE-U/LAA, and 5G New Radio Unlicensed ("5G NR-U). Indeed, this is the genius of the Commission's unlicensed wireless framework, which sets forth technology-neutral rules that encourage continuous wireless innovation and which, by design, does not require a new rulemaking to enable each new wireless technology.

11 *See, e.g.,* 47 C.F.R. § 15.407(a)(1)(i) & (j).

Conclusion

Qualcomm requests that the FCC promptly dismiss the Globalstar Petition because it fails to demonstrate that U-NII-1 operations are currently causing or soon will cause interference to Globalstar's licensed satellite service. As explained herein and in the chorus of oppositions from many in the wireless industry, Globalstar fails to provide a technically sound basis for its request that the FCC institute a Notice of Inquiry to monitor unlicensed operations in the 5150-5250 MHz band. Unlicensed outdoor operations using the U-NII-1 band are a prime example of successful sharing, for this unlicensed band is providing U.S. consumers and businesses with gigabit connectivity to support countless applications and services, and economic growth and improved lives, without causing harmful interference to Globalstar.

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Certificate of Service

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